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Public Health Concerns for Dental Caries Vaccine

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The oral health plays a fundamental role in determining overall health and quality of life. However, dental caries, which is an infectious microbial illness that affects teeth, continues to be a major issue affecting oral health in both developed and developing countries. The World Health Organization confirmed the increasing dental caries prevalence as a significant global health issue.[1] This letter emphasizes the importance of developing an affordable dental caries vaccine and that it has to be included in the routine vaccination chart of all children by the public health department with a broad focus and long-term vision.

Since dental caries is an irreversible microbiological disease of the tooth and fits the definition of an infectious disease, researches to develop vaccines for dental caries are of utmost interest. A caries vaccine's primary function is to play a protective and preventive role against tooth decay. It is well recognized that *Streptococcus mutans* contributes significantly to the pathophysiology of tooth decay since its cells mostly contain materials such as adhesins, glucosyl transferases (GTFs), glucan-binding proteins (GBPs), a 13-kDa protein antigen (antigen D), a 39-kDa protein (AgIII), a 29-kDa protein antigen (antigen A), 190-kDa protein (AgI/II), and a 70-kDa protein antigen (antigen C). As these cellular substances were believed to be essential to the interactions between the organism and host, the majority of caries vaccine trials focused on these substances.[2,3] Various routes of drug administration like oral, systemic, and gingivo-salivary routes are suggested and by ways of active and passive immunization.

Some promising vaccines like pGJA-P/VAX, LT derivative/Pi39–512, KFD2-rPAc, and SBR/GBR-CMV-nirB have been developed recently and subjected to animal testing.[4] Researchers need to investigate new virulence targets. Human clinical trials and many collaborative studies are necessary, and interest from funders and public health specialists should come to address and support these researches and to overcome financial hurdle for the same.

What Is Known?

- Dental caries is a complex, irreversible, multifactorial opportunistic infection.
- Because of the high cost of treatment, this is a public health issue.
- There is currently no commercially available vaccine, despite many years of promising laboratory research, animal tests, and clinical trials.

What Is Unknown?

- The lessons learnt throughout the years have led to more defined research objectives.
- Vaccines, which are multigenic DNA/re, employ the most effective adjuvants with nasal or sublingual route of delivery system.
- These vaccines should be developed and tested through multicentric collaboration. Furthermore, newer targets for the action of vaccine should be identified and researched.

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Conflict of Interest
None declared.

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